Appl. No. 10/608,391 Amdt. dated March 17, 2006 Reply to Office Action of January 6, 2006

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1-31. (Canceled)

1	32. (New): A storage system coupled to a host computer via a network
2	comprising:
3	a data volume storing write data from the host computer;
4	a snapshot storing area storing a first snapshot of at least a portion of the data
5	volume for a first point in time, the first point in time represented by first information that
6	specifies a time when the first snapshot is taken, the snapshot storing area further storing a
7	second snapshot of said at least a portion of the data volume for a second point in time, the
8	second point in time represented by second information that specifies a time when the second
9	snapshot is taken;
10	a journal storing area storing journal entries, wherein the journal entries comprise
11	the write data and time ordering information specifying write ordering of write operations to the
12	data volume; and
13	a storage controller to conduct write operations according to write requests
14	received from the host computer, to manage snapshot operations to store a plurality of snapshots
15	including the first snapshot and the second snapshot, and to manage journal operations to record
16	the journal entries,
17	wherein the first and second information are associated with the time ordering
18	information to specify time ordering among a time when one of the write operations is
19	conducted, the first point in time, and the second point in time,
20	wherein when receiving a data recovery request with a target time between the
21	first point in time and the second point in time, the storage controller selects one of the first
22	snapshot or the second snapshot based on the first information, the second information and the

Appl. No. 10/608,391 Amdt. dated March 17, 2006 Reply to Office Action of January 6, 2006

1

2

1

2

1

2

3

1

2

- target time, and selects at least one of the journal entries corresponding to the write operation conducted between one of the first or second point in time associated with the selected snapshot and the target time based on one of the first or the second information associated with the selected snapshot, the time ordering information, and the target time to recover data of said at least a portion of the data volume at the target time by using the selected snapshot and said at least one of the journal entries,
 - wherein the storage controller monitors the journal storing area and releases at least one of the stored journal entries.
 - 1 33. (New): The storage system of claim 32, wherein the time ordering information includes time information and/or a sequence number.
 - 34. (New): The storage system of claim 33, wherein the first and second information include time information and/or a sequence number.
 - 1 35. (New): The storage system of claim 32, wherein the write data stored in the journal storing area are stored in chronological order.
 - 36. (New): The storage system of claim 32, wherein the snapshot storing area and/or the journal storing area are configured with storage volumes.
 - 37. (New): The storage system of claim 32, wherein at least one of the journal entries are stored in the journal storing area before storing one of the plurality of snapshots in the snapshot storing area.
 - 38. (New): The storage system of claim 32, wherein the journal operations are started prior to starting the snapshot operations.
 - 1 39. (New): The storage system of claim 32, wherein the selected snapshot is closest in time to the target time.

1	40. (New): The storage system of claim 32, wherein the selected snapshot is
2	prior in time to the target time.
1	41. (New): A method for storing information on a storage system coupled to a
2	host computer via a network, the method comprising:
3	conducting a write request received from a host computer, the write operation
4	request including write data associated therewith to be stored on a data volume;
5	storing journal data corresponding to the write data to the data volume from the
6	host computer;
7	storing time ordering information specifying write ordering of the write data to
8	the data volume from the host computer;
9	storing a first snapshot of at least a portion of the data volume for a first point in
10	time, the first point in time represented by first information that specifies a time when the first
11	snapshot is taken; and
12	storing a second snapshot of a the portion of the data volume for a second point in
13	time, the second point in time represented by second information that specifies a time when the
14	second snapshot is taken;
15	wherein the first and second information are associated with the time ordering
16	information to specify time ordering among a time when the write request is conducted, the first
17	point in time, and the second point in time,
18	wherein when receiving a data recovery request with a target time between the
19	first point in time and the second point in time, the storage system selects one of the first
20	snapshot or the second snapshot based on the first information, the second information and the
21	target time, and selects at least one of the journal data entries corresponding to the write request
22	conducted between one of the first or second point in time associated with the selected snapshot
23	and the target time based on one of the first or the second information associated with the
24	selected snapshot, the time ordering information, and the target time to recover data of the
25	portion of the data volume at the target time by using the selected snapshot and the selected at
26	least one of journal data,

Appl. No. 10/608,391 Amdt. dated March 17, 2006 Reply to Office Action of January 6, 2006

- wherein the storage system releases at least one of the stored journal data to prevent from overflowing the journal data.
 - 1 42. (New): The storage system of claim 41, wherein the time ordering 2 information includes time information and/or sequence number.
 - 1 43. (New): The storage system of claim 41, wherein the first and second 2 information include time information and/or sequence number.
 - 1 44. (New): The storage system of claim 41, wherein the plurality of journal data are stored in chronological order.
 - 1 45. (New): The storage system of claim 41, wherein at least one of the journal 2 data are stored before storing the first and second snapshots.
 - 3 46. (New): The storage system of claim 41, wherein the selected snapshot is 4 closest in time to the target time.
 - 1 47. (New): The storage system of claim 41, wherein the selected snapshot is 2 prior in time to the target time.